

The Atomic Hydrogen Corona of Saturn

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About 700 hours of Voyager 1 ultraviolet spectrometer observations (both pre- and post-encounter) of H Lyman α emissions from the vicinity of Saturn have been aggregated and analyzed. We included more observation time than previous analyses ($\approx 2\times$ that of *Shemansky and Hall, JGR 97, 4143, '92*) because the emissions are faint and are superimposed onto a comparably luminous background. The analysis technique was a least-squares fit of density basis functions integrated along each observation's line of sight with degree of fit adjusted using singular value decomposition (SVD) of the fit matrix.

Although the results are preliminary, we provisionally conclude that the atomic hydrogen density at a distance of $\approx 2 R_S$ from Saturn is on the order of 100 cm^{-3} or more, falling off to a fraction of that value at $\approx 10 R_S$ before rising back up to $\approx 100 \text{ cm}^{-3}$ or more near the orbit of Titan. This distribution suggests that both Titan and either the rings or atmosphere of Saturn are significant sources of atomic hydrogen for the magnetosphere.

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